

01-822

REMARKS

Claims 1-20 are in the case. Claims 17-18 are allowed, and claims 5, 9-10, and 14-16 are indicated as allowable if rewritten in independent form (and to overcome the 112 rejection), for which indication the applicants thank the examiner. Claims 1-3, 7-8, and 11-13 are rejected under 35 USC § 103 over USPN 6,315,883 to Mayer et al. in view of USPN 6,149,830 to Lin et al. Claim 5 has been amended. The 103 rejections are respectfully traversed. Reconsideration and allowance of the claims are requested.

CLAIM OBJECTIONS

Claims 9-10 and 14-16 are objected to as depending from rejected base claims. However, the office action states that these claims would be allowable if rewritten so as to not depend from a rejected base claim, and to contain all the limitations of the base claim and any intervening claims. However, applicants believe that claim 1, from which claims 9-10 and 14-16 depend, is allowable. Therefore, applicants defer from amending claims 9-10 and 14-16 at this time.

CLAIM REJECTIONS UNDER §112

Claim 5 is rejected under 35 U.S.C. 112, but is indicated as being allowable if that rejection is overcome. Applicants have amended claim 5 to remove the typographical error, and recite silicone oil instead of silicon oil. As mentioned above, applicants believe that claim 1, from which claim 5 depends, is allowable. Therefore, applicants defer from further amending claim 5 at this time.

CLAIM REJECTIONS UNDER §103

Claims 1-3, 7-8, and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mayer et al. Independent claim 1 claims, *inter alia*, a method for planarizing a surface of a substrate by applying a viscous material to the surface, immersing the substrate, applying an electrical potential, and *agitating* the solution, *thereby selectively uncovering at least features that are relatively high*, and thereby preferentially planarizing at least the features that are relatively high.

01-822

Mayer et al. do not describe such a process. The examiner points out one of the distinguishing features of the present invention, by mentioning the *agitation*, which is an essential step of the present process as claimed, but which is not described by Mayer et al. The reason for this is that the agitation is not merely an obvious matter of design choice, in that the agitation is not intended to ensure complete distribution of the solution, as suggested by the examiner. Rather, the agitation is applied so as to *selectively uncover features that are relatively high*. The relatively low features are protected from the mechanical effects of the agitation by the higher features, and so they remain covered and do not selectively etch. However, the higher features, being relatively unprotected from such agitation, are uncovered and exposed to the electrochemical etching.

This method is, thus, quite different from that as described by Mayer et al. Mayer et al. do not agitate, because they use a diffusion and dissolving action to remove the diffusion barrier 219. Thus, two very different processes are described by Mayer et al. and the present invention as claimed in claim 1. Therefore, claim 1 patentably defines over Mayer et al. Reconsideration and allowance of claim 1 are respectfully requested.

Dependent claims 2-3, 7-8, and 11-13 depend from independent claim 1, and contain additional important aspects of the invention. Therefore, dependent claims 2-3, 7-8, and 11-13 patentably define over Mayer et al. Reconsideration and allowance of dependent claims 2-3, 7-8, and 11-13 are respectfully requested.

Claims 4, 6, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mayer et al. in view of Lin et al. Claims 4 and 6 depend from claim 1, and therefore claim, *inter alia*, a method for planarizing a surface of a substrate by applying a viscous material to the surface, immersing the substrate, applying an electrical potential, and *agitating* the solution, *thereby selectively uncovering at least features that are relatively high*, and thereby preferentially planarizing at least the features that are relatively high.

The deficiencies of Mayer et al. in regard to this combination of limitations are described above. Lin et al. do not remedy the deficiencies of Mayer et al., in that Lin et al. also do not describe agitating an electrochemical etching solution so that relatively high features are uncovered and selectively etched. Further, Lin et al. do not describe an electropolishing process at all, but rather describe a chemical mechanical polishing process that is very different from the present method as claimed, and from Mayer et al.

01-822

Applicants assert that Mayer et al. and Lin et al. are so different, that the combination of the two references is improper. However, as mentioned above, even when combined in the specific manner as described in the office action, the two references omit essential elements of the present invention as claimed.

Therefore, claims 4 and 6 patentably define over Mayer et al. in view of Lin et al. Reconsideration and allowance of claims 4 and 6 are respectfully requested.

Similar to that as described above in regard to claim 1, independent claim 19 claims, *inter alia*, a method for planarizing a copper layer by *immersing* the substrate in an electrically conductive solution containing *glycerol*, whereby *the low features are covered*, applying an electrical potential, and *agitating the solution*, thereby *selectively uncovering features that are relatively high*, and thereby preferentially planarizing at least the features that are relatively high.

As mentioned above, the combination of Mayer et al. and Lin et al. does not describe this combination of limitations. Specifically, the combination of Mayer et al. and Lin et al. does not describe agitation of the solution to selectively uncover the relatively high features, as recited in claim 19.

Therefore, claim 19 patentably defines over Mayer et al. in view of Lin et al. Reconsideration and allowance of claim 19 are respectfully requested. Claim 20 depends from independent claim 19 and recites additional important aspects of the invention. Therefore, claim 20 patentably defines over Mayer et al. in view of Lin et al. Reconsideration and allowance of claim 20 are respectfully requested.

CONCLUSION

Applicants assert that the claims of the present application patentably define over the prior art made of record and not relied upon for the same reasons as given above. Applicants respectfully submit that a full and complete response to the office action is provided herein, and that the application is now fully in condition for allowance. Action in accordance therewith is respectfully requested.

In the event this response is not timely filed, applicants hereby petition for the appropriate extension of time and request that the fee for the extension be charged to deposit account 12-2355. If other fees are required by this amendment, such as fees for

To: 1-703-872-9306

From: 1.865.934.0444

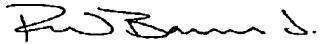
10/25/2004 3:55:19 PM (Page 9 of 9)

01-822

additional claims, such fees may be charged to deposit account 12-2252. Should the examiner require further clarification of the invention, it is requested that s/he contact the undersigned before issuing the next office action.

Sincerely,

LUEDEKA, NEELY & GRAHAM, P.C.

By: 

Rick Barnes, 39,596

2004.10.25